

New acavid land snails from Madagascar

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Abstract: Descriptions are given of *Ampelita akoratsara* sp. nov., *A. ambaniana* sp. nov., *A. analamerae* sp. nov., *A. anjanaharibei* sp. nov., *A. ivohibei* sp. nov., *A. josephinae* sp. nov., *A. masoalae* sp. nov., *A. ranomafanae* sp. nov., *A. raxworthyi* sp. nov., *A. (Eurystyla) griffithsi* sp. nov., *Clavator griffiths-jonesi* sp. nov., *C. masoalae* sp. nov., and *Helicophanta gargantua* sp. nov. Discovery of *A. (Eurystyla) griffithsi* sp. nov. greatly expands the geographical, ecological, and morphological ranges of its subgenus. Madagascar's 115 species of acavids are in drastic need of revision.

Key words: Gastropoda, Stylommatophora, Acavacea, *Ampelita*, *Clavator*, *Helicophanta*

This paper is the fifth in a series on the Acavidae of Madagascar (Emberton, 1990, 1994, 1995a, 1995b). A recent survey and inventory of Madagascar has yielded extensive collections of acavids; identifications are incomplete but so far have yielded the thirteen new species described herein. With these additions, Madagascar's recognized species of acavids (Fischer-Piette *et al.*, 1994) now total 115.

METHODS AND MATERIALS

Materials were collected 1992-1995. Identifications and comparisons were made using Fischer-Piette *et al.* (1994) and available collections. Measurements were made using vernier calipers. Due to ongoing habitat destruction and the urgency of making this fauna known to conservationists and systematists, only conchological descriptions have been given, except for one case in which dissection of the genitalia was required for generic assignment.

SYSTEMATICS

Higher classification follows Nordsieck (1986). Latitudes and longitudes are given in degrees and minutes. Types are placed in the United States National Museum, Washington, D.C. (USNM); the Australian Museum, Sydney (AMS); the Muséum national d'Histoire naturelle, Paris (MNHN, which does not assign catalog numbers to types); and the Academy of Natural Sciences of Philadelphia (ANSP). Prior, working catalog numbers of the Molluscan Biodiversity Institute (MBI), are also given, as they provide access to an ecological database of stations,

available on request. MBI catalog numbers consist of station number, reference number of the species within the station, D (dry) or A (alcohol-preserved), and H (holotype) or P (paratype) or PR (paratype "representative" that is illustrated and/or described). In lot descriptions, ad means adult(s), juv juvenile(s).

Class GASTROPODA
Subclass PULMONATA
Order STYLOMMATOPHORA
Suborder SIGMURETHRA
Infraorder ACHATINIDA
Superfamily ACAVOIDEA
Family ACAVIDAE Pilsbry, 1895

The *Faune de Madagascar's* monograph on terrestrial pulmonate gastropods (Fischer-Piette *et al.*, 1994) was a delayed, posthumous publication that overlooked some prior systematic changes within the Madagascan acavids. The most important of these were Mead's (1985) transfer of *Leucotaenius* Martens, 1860, from Achatinidae to Acavidae, and Emberton's (1990) reduction of *Eurystyla* Ancy, 1887, to a subgenus of *Ampelita* Beck, 1837; establishment of the new subgenera *Ampelita (Vesconis)* Emberton, 1990, and *A. (Xystera)* Emberton, 1990; and transfer of *Ampelita covani* (Smith, 1879) to Rhytididae (provisionally to *Rhytida* Albers, 1860).

Genus *Ampelita* Beck, 1837

Emberton's (1990) four subgenera of *Ampelita* were based on single anatomical differences, most of his species assignments to those subgenera were provisional and based on shells, and one such assignment was later contradicted

by allozyme evidence (Emberton, 1995a). The genus *Ampelita* is seriously in need of revision. Such a project would be aided by the anatomical and frozen-tissue materials now available for many species (Emberton, unpublished, this paper). In the meantime, however, there is no point in trying to assign these new species to subgenera, except for the one *A. (Eurystyla)*.

Fischer-Piette *et al.* (1994:87-89, 147), in contrast, put *Ampelita* species into six phenetic groups—counting *A. (Eurystyla)* as the sixth—based on gross shell morphology. Despite some inconsistencies, these are useful for identification purposes, so have been followed here. Species are arranged alphabetically within Fischer-Piette *et al.*'s (1994) groups. Written definitions of the groups were sketchy and inconsistent, so are clarified and corrected here, based on included species. Except for Group 6, these groups have no taxonomic validity.

Group 1. Non-carinate, rounded periphery; low spired; umbilicus broad to narrow; peristome slightly to moderately reflected; no dorsal, spiral gutter.

Ampelita anjanaharibei sp. nov.

Fig. 1

HOLOTYPE. USNM 880350 (ex MBI 693.50DH and AH, ad shell and pulled body in alc): 14°44'S, 49°26'E: Madagascar: Anjanaharibe Sud Reserve, 1750 m. 20 Oct. 1995.

PARATYPE. AMS C.203526 (ex MBI 697.50DP, 1 ad): 14°44'S, 49°26'E: Madagascar: Anjanaharibe Sud Reserve, 1650 m. 20 Oct. 1995.

DESCRIPTION OF HOLOTYPE. Diameter 41.5 mm, height 24.0 mm, whorls 4.6. Body-whorl periphery rounded; suture moderately impressed, faintly crenulate; shoulder narrow, nearly a flat shelf. Umbilicus narrowly funneled, faintly enlarged by a rounded rim; width 5.4 mm (0.13 shell diameter). Aperture compressed-elliptical, height 11.7 mm, width 19.4 mm. Aperture downward deflection moderate, 0.1 whorl; face angle (relative to axis of coiling) 45°. Apertural lip reflection narrow to moderately wide, widest above; sharp edge rolled back and nearly under. Embryonic whorls 2.2; embryonic sculpture nearly smooth, then with minute pustules. Shell with a satin-like sheen, covered with small pustules, and with low, transverse growth lines and faint spiral lines. Color chocolate brown with rare, light-yellow, transverse-linear flecks, with a brownish yellow subsutural band that has a distinct upper edge and an indistinct lower edge, and with a narrow yellow-brown band on the umbilical rim.

VARIATION. Single paratype virtually identical to holotype, but with broken lip.

COMPARISONS. Very similar in size and shape to some *Ampelita subatropos* (Dautzenberg, 1894), but with a much

narrower umbilicus and more rapid whorl expansion, and with a glossier, more rugose, less spirally engraved sculpture. Rounder whorls, tighter coiling, and smaller umbilicus than *A. gaudens* (Mabille, 1884). Completely lacks the spiral, dorsal gutter of other *Ampelitas* of the same size.

ETYMOLOGY. For Anjanaharibe Reserve, the type locality.

Ampelita ivohibei sp. nov.

Fig. 2

HOLOTYPE. USNM 880351 (ex MBI 1499.50DH and AH, ad shell and pulled body in alc): 24°34'S, 47°12'E: Madagascar: Ivohibe Forest, 570 m. 30 Oct. 1992.

PARATYPE. ANSP 401985 (ex MBI 1504.50DP, subadult shell): 24°34'S, 47°12'E: Madagascar: Ivohibe Forest, 400 m. 30 Oct. 1992.

DESCRIPTION OF HOLOTYPE (preserved in ethanol before the body was removed, therefore with some dissolution pits and breakage). Diameter 20.3 mm, height 10.8 mm, whorls 3.8. Body-whorl periphery rounded; suture very strongly and deeply impressed, simple; shoulder broad, flatly rounded. Umbilicus funneled, faintly enlarged by a slight, rounded rim; width 2.3 mm (0.11 shell diameter). Aperture compressed-elliptical, height 5.1 mm, width 8.9 mm. Aperture downward deflection moderate, <0.1 whorl; face angle (relative to axis of coiling) 55°. Apertural lip reflection narrowly and evenly rolled, thin edged. Embryonic whorls 2.2; embryonic sculpture apparently smooth. Shell somewhat glossy, with faint, irregular growth lines—otherwise smooth. Coloration consisting of transverse, irregular stripes of dark brown and ivory, overlain with four interrupted, peripheral bands of ivory.

COMPARISONS. Unique for its tiny size and flat spire. Most similar to *Ampelita anosiana* Fischer-Piette, Blanc, Blanc, and Salvat, 1994, which is larger, with looser coiling, broader umbilicus, and sunken apex.

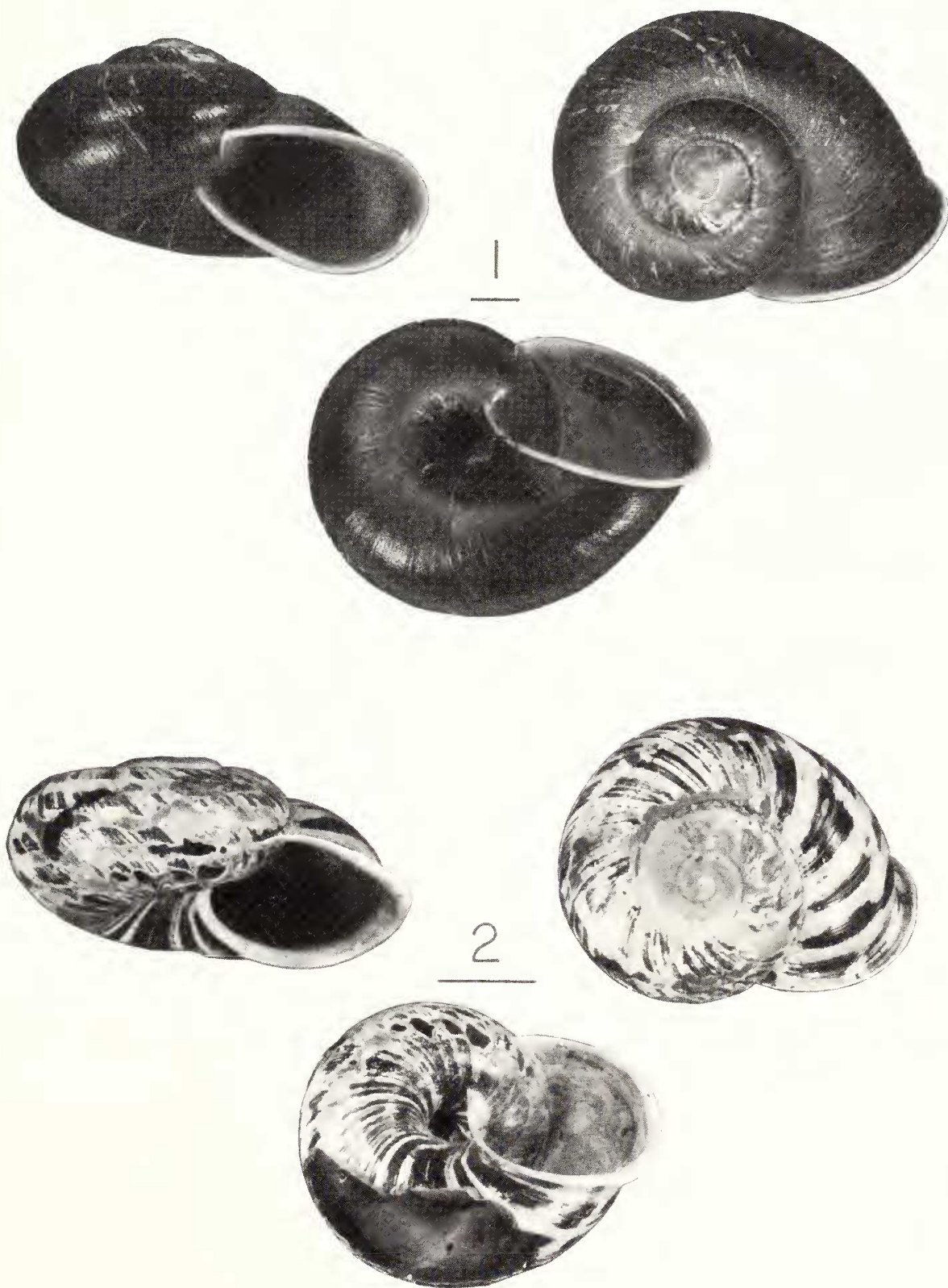
ETYMOLOGY. For Mount Ivohibe, also known as Mount Varabe, near the type locality.

Ampelita masoalae sp. nov.

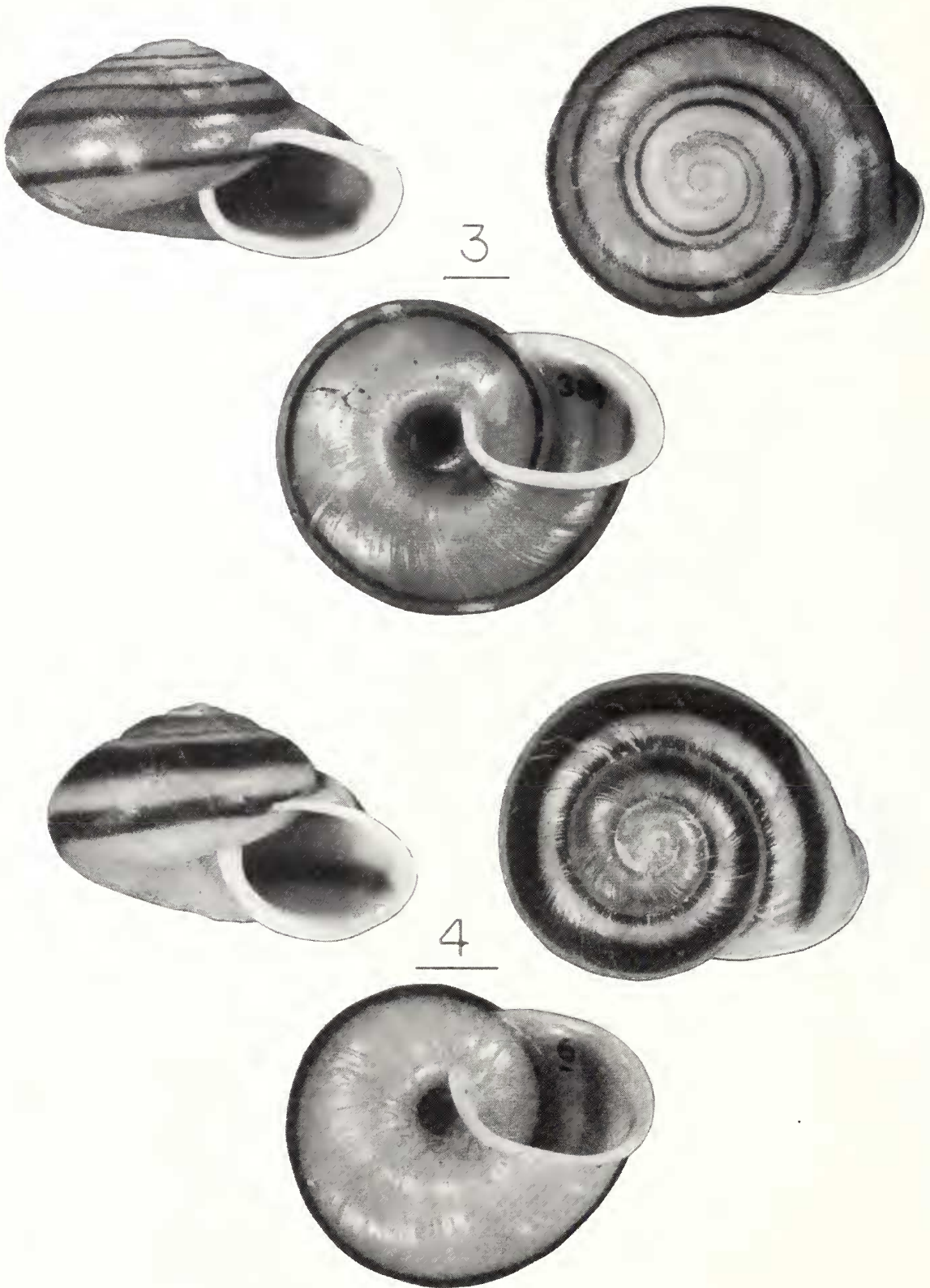
Fig. 3

HOLOTYPE. USNM 880352 (ex MBI 309.50DH and AH, ad shell and pulled body in alc): 15°33'S, 50°0'E: Madagascar: Masoala National Park, 1000 m: hardwood rainforest with palms, pandanus, and tree moss. 26 Sep. 1995.

PARATYPES. AMS C.203484 (ex MBI 309.50DP, 1 ad): type locality. MNHN (ex MBI 309.50DP, 1 ad): type locality. ANSP 401986 (ex MBI 309.50DP, 1 ad): type locality. USNM 880353 (ex MBI 309.50DPR [1 juv], MBI 309.50DP [18 ad, 18 juv], and MBI 309.50AP [1 juv]): type locality. USNM 880400 (ex MBI 644.50DP, 4 ad, 2 juv & frag): 14°28'S, 49°34'E: Madagascar: Marojeje Reserve, incidental collecting along trail, 1050 m average elevation, 27 Sep. 1995.



Figs. 1-2. Fig. 1. *Ampelita anjanaharibei* sp. nov. holotype. Fig. 2. *A. ivohibei* sp. nov. holotype. Scale bars 5 mm.



Figs. 3-4. Fig. 3. *Ampelita masoalae* sp. nov. holotype. Fig. 4. *A. raxworthyi* sp. nov. holotype. Scale bars 5 mm.

DESCRIPTION OF HOLOTYPE (apex eroded). Diameter 30.0 mm, height 17.3 mm, whorls 4.6. Body-whorl periphery sharply rounded, with a faint trace of angulation; suture moderately impressed, simple; shoulder broadly rounded. Umbilicus broadly funneled, with only a slight trace of a rim; width 4.9 mm (0.16 shell diameter). Aperture compressed-elliptical, height 7.0 mm, width 11.7 mm. Aperture downward deflection moderate, 0.1 whorl; face angle (relative to axis of coiling) 40°. Apertural lip reflection narrowly to moderately wide, widest above; sharp edge rolled back and nearly under. Embryonic whorls 1.9. Shell with a faint sheen, bearing moderate-sized pustules, faint growth lines, and traces of dense spiral lines. Color dark yellow with three narrow bands of reddish brown; umbilicus with diffuse red-brown splotches; peristome and apertural interior white.

EMBRYONIC SCULPTURE (Paratype USNM 880353). Embryonic sculpture nearly smooth, but with faint transverse ribs and even fainter traces of spiral lines.

VARIATION. Shells from MBI 644 considerably flatter (H/D 0.50) and with a proportionally wider aperture (AW/D 0.42) and slightly more flared upper apertural lip; some paratypes lack color bands; adult diameters range 27.6–33.1 mm.

COMPARISONS. More tightly coiled than *Ampelita futura* Fischer-Piette and Garreau, 1965, the holotype of which has about three whorls (Fischer-Piette *et al.*, 1994:plate V, fig. 12), not four as described (Fischer-Piette *et al.*, 1994:90). Much more compressed whorls than *A. subsepulchralis* (Crosse, 1868). Differs from *A. consanguinea* (Férussac, 1851) and others of similar size and shape by its relatively wide, white peristome, in addition to other details.

ETYMOLOGY. For Masoala National Park, the type locality.

COMMENTS. Apparently restricted to high elevations. The Masoala and Marojejy populations thus appear to be extremely isolated and could be separate species or subspecies.

Ampelita raxworthyi sp. nov.

Fig. 4

HOLOTYPE. USNM 880354 (ex MBI 6.50DH and AH, ad shell and pulled body in alc): 24°46'S, 47°9'E: Madagascar: Forêt Sainte Luce, 10 m: coastal rainforest. 29 Jan. 1995.

PARATYPES. AMS C.203485 (ex MBI 6.50DP, 1 ad): type locality. MNHN (ex MBI 6.50DP, 1 ad): type locality. ANSP 401987 (ex MBI 6.50DP, 1 ad): type locality. USNM 880401 (ex MBI 6.50DP [4 ad, 6 juv] and MBI 7.50AP [1 juv, beat from vegetation, in alc]): type locality.

DESCRIPTION OF HOLOTYPE. Diameter 22.0 mm, height 14.5 mm, whorls 4.2. Body-whorl periphery rounded; suture moderately impressed, simple; shoulder narrow,

nearly flat. Umbilicus a narrow pit, with only a slight trace of a rim; width 2.9 mm (0.13 shell diameter). Aperture compressed-elliptical, height 6.2 mm, width 9.1 mm. Aperture downward deflection moderate, 0.2 whorl; face angle (relative to axis of coiling) 50°. Apertural lip reflection narrowly and evenly rolled, thin edged. Embryonic whorls 2.1; embryonic sculpture nearly smooth in the first whorl, then with faint riblets. Shell slightly glossy, almost smooth, but with faint, irregular growth lines and obscure traces of spiral lines. Color yellow, with three dark reddish brown bands: one narrow subsutural, one broad suprapertural, and one medium-broad subperipheral.

VARIATION. Smallest shell diameter 18.7 mm.

COMPARISONS. The small, compact, globose, umbilicate shape is approached only by *Ampelita parva* Fischer-Piette and Garreau, 1965, which is more domed and tightly coiled, and *A. petiti* Fischer-Piette, 1952, which is also more tightly coiled and has an unreflected upper peristome. *A. globulus* Fischer-Piette, Blanc, and Vukadinovic, 1974, bears some resemblance, but has a proportionally much larger aperture and looser coiling.

ETYMOLOGY. For Dr. Chris Raxworthy, herpetologist and biogeographer, who suggested collecting at the type locality.

Group 2 (no new species). Sub-carinate to non-carinate; low spired; umbilicus moderate to broad; peristome moderately reflected; no dorsal, spiral gutter.

Group 3. Carinate; low spired; umbilicus narrow or imperforate; peristome moderately reflected; no dorsal, spiral gutter.

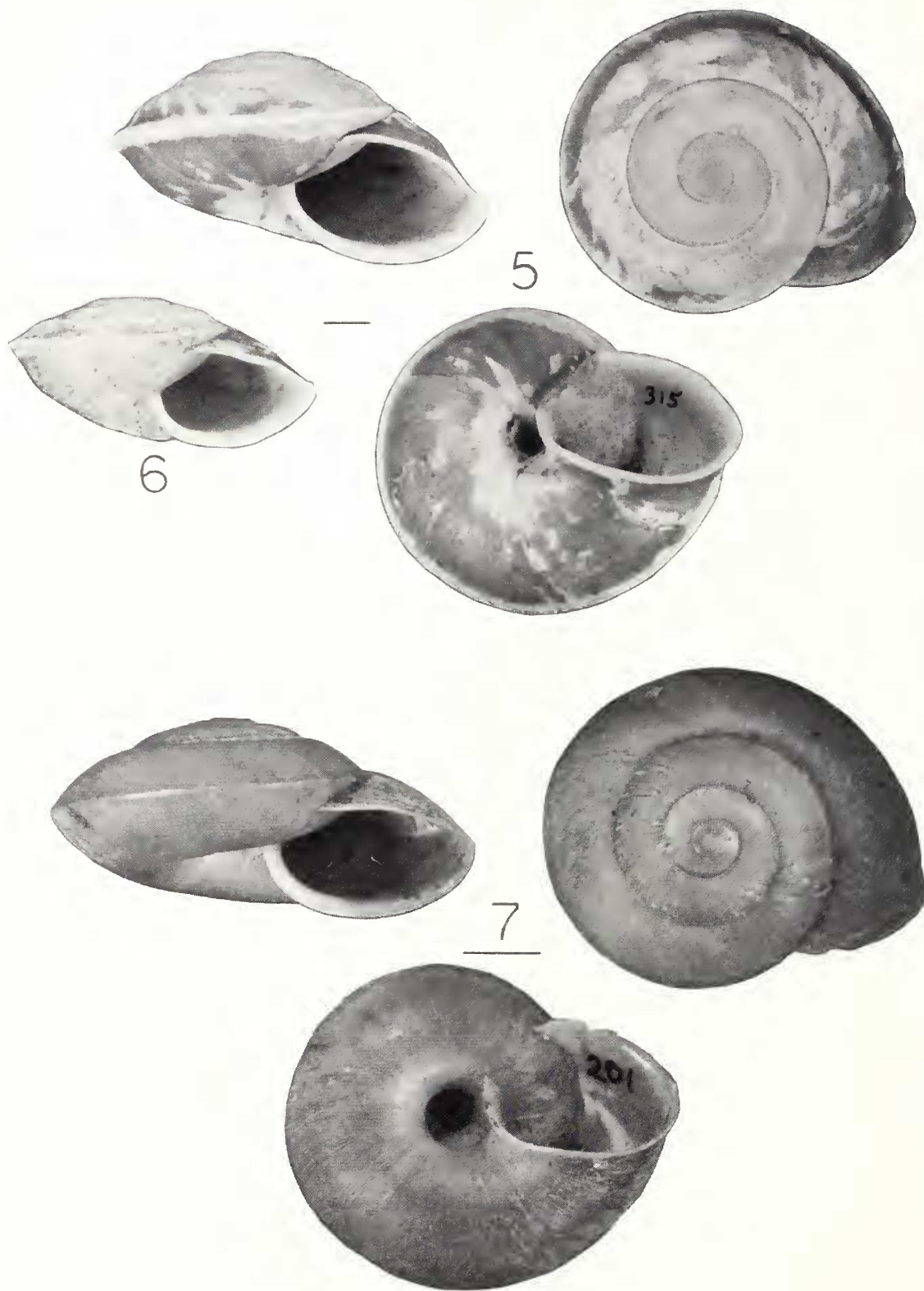
Ampelita ambaniana sp. nov.

Figs. 5, 6

HOLOTYPE. USNM 880355 (Fig. 5, ex MBI 315.50DH, ad shell): 15°40'S, 49°58'E: Madagascar: Masoala Peninsula: near Mount Ambaniana, trail to Andranobe, 0 to 300 m. 29 Sep. 1995.

PARATYPES. AMS C.203486 (ex MBI 315.50DP, 1 ad): type locality. MNHN (ex MBI 315.50DP, 1 ad): type locality. ANSP 401988 (ex MBI 315.50DP, 1 ad): type locality. USNM 880356 (Fig. 6, ex MBI 315.50DPR [ad shell]; and ex MBI 315.50DP [2 frag]): type locality.

DESCRIPTION OF HOLOTYPE (a weathered shell retaining about half of the body-whorl periostracum). Diameter 39.4 mm, height 23.2 mm, whorls 4.7. Body-whorl periphery carinate, carina wide, blunt-edged, and shallowly guttered above and below; suture shallowly impressed, bordered on either side by broad, shallow gutters; shoulder narrow, rounded, then dropping off steeply into a shallow gutter. Umbilicus narrow, steep-sided, faintly enlarged by a slightly angular rim; width 2.9 mm (0.07



Figs. 5-7. Figs. 5-6. *Ampelita ambaniana* sp. nov.: Fig. 5 holotype in three views; Fig. 6 paratype small adult in one view. Fig. 7. *A. analamerae* sp. nov. holotype. Scale bars 5 mm.

shell diameter). Aperture compressed-elliptical, height 10.8 mm, width 18.9 mm. Aperture downward deflection moderate, <0.1 whorl; face angle (relative to axis of coiling) 40°. Apertural lip reflection narrow, thin, incompletely rolled, narrow above, wider below. Shell sculpture consisting of parallel, slightly wavy, spiral lines; faint, broad growth ridges; and obscure, short, oblique cut marks that sometimes give a herringbone appearance. Color yellowish brown, sometimes with a faintly greenish cast.

VARIATION. Largest diameter 41.3 mm, most elevated shell H/D 0.60.

COMPARISONS. Differs from all others of Fischer-Piette *et al.*'s (1994) group 3 species by its two broad, dorsal, spiral channels, and by its round-edged, cord-like carina. In general shape it most resembles *Ampelita stumpfi* (Kobelt, 1880), but it has much looser coiling. Its size, coiling, color, and sculpture are similar to those of *A. lancula* (Férussac, 1821), from which it differs—in addition to its unique characters—by its more rounded aperture and greater pre-apertural downward deflection.

ETYMOLOGY. For Mount Ambaniana, near the type locality.

Group 4. Carinate; low spired; umbilicus broad; peristome narrowly reflected; no dorsal, spiral gutter.

Ampelita akoratsara sp. nov.

Fig. 8

HOLOTYPE. USNM 880357 (ex MBI 657.50DH and AH, ad shell and pulled body in alc): 14°32'S, 49°42'E: Madagascar: near Marojejy Reserve, Ambatosorotra Mountain, 800 m: rainforest. 4 Oct. 1995.

PARATYPES. AMS C.203487 (ex MBI 648.50DP, 1 ad): 14°29'S, 49°33'E: Madagascar: Marojejy Reserve W, 805 m: rainforest; 28 Sep. 1995. MNHN (ex MBI 626.50DP, 1 ad): 14°20'S, 49°35'E: Madagascar: Marojejy Reserve W, incidental along trail, 950 m average elevation: rainforest; 24 Sep. 1995. ANSP 401989 (ex MBI 626.50DP, 1 ad): 14°20'S, 49°35'E: Madagascar: Marojejy Reserve W, incidental along trail, 950 m average elevation: rainforest; 24 Sep. 1995. USNM 880402, 880404 (ex MBI 626-631DP, 2 lots; total 2 ad, 2 juv): 14°S, 49°E: Madagascar: Marojejy Reserve W, incidental along trail, 950-1125 m: rainforest; Sep. 1995. USNM 880403, 880405, 880406 (ex MBI 657-674DP, 3 lots; total 2 ad, 1 juv): 14°32'S, 49°42'E: Madagascar: near Marojejy Reserve, Ambatosorotra Mountain, 800-940 m: rainforest; Oct. 1995. USNM 880407, 880408 (ex MBI 704-705DP, 2 lots; total 1 ad, 1 juv): 14°45'S, 49°28'E: Madagascar: Anjanaharibe Sud Reserve, 1100-1185 m: rainforest; 23 Oct. 1995.

DESCRIPTION OF HOLOTYPE. Diameter 27.6 mm, height 13.1 mm, whorls 4.0. Body-whorl periphery sharply carinate; suture shallowly impressed, simple; shoulder narrow, flattish. Umbilicus funneled, enlarged by a sharply angular rim; width 3.8 mm (0.14 shell diameter). Aperture

compressed-elliptical, height 5.7 mm, width 11.7 mm. Aperture downward deflection great, 0.1 whorl; face angle (relative to axis of coiling) 60°. Apertural lip reflection narrow, thin, rolled, even. Embryonic whorls 2.0; embryonic sculpture nearly smooth, with slight, irregular pitting. Shell slightly glossy, with parallel spiral grooves transected by slightly fainter, more irregular growth lines. Ground color light brown; periphery and suture with a single thick band of white edged with dark brown; umbilicus slightly darker brown than ground color and edged with a band of light beige; peristome light beige.

VARIATION. Adult paratype diameters range 26.3-29.5 mm; less extreme preapertural downward deflections occur in several paratypes.

COMPARISONS. Among carinate, widely umbilicate *Ampelita* (Fischer-Piette *et al.*'s, 1994, group 4), most similar in size, shape, and general sculpture to *A. ranomafanae* sp. nov., but differs in its smooth (vs. pustulose) embryonic sculpture, its less shelved carina, and its greater pre-apertural deflection. Within group 4, *A. akoratsara* sp. nov. and *A. ranomafanae* sp. nov. share their spiral-groove sculpture only with *A. namerokoensis* Fischer-Piette, 1952, which is much more tightly coiled.

ETYMOLOGY. For the beautiful (Malagasy "tsara") shell (Malagasy "akora").

Ampelita analamerae sp. nov.

Fig. 7

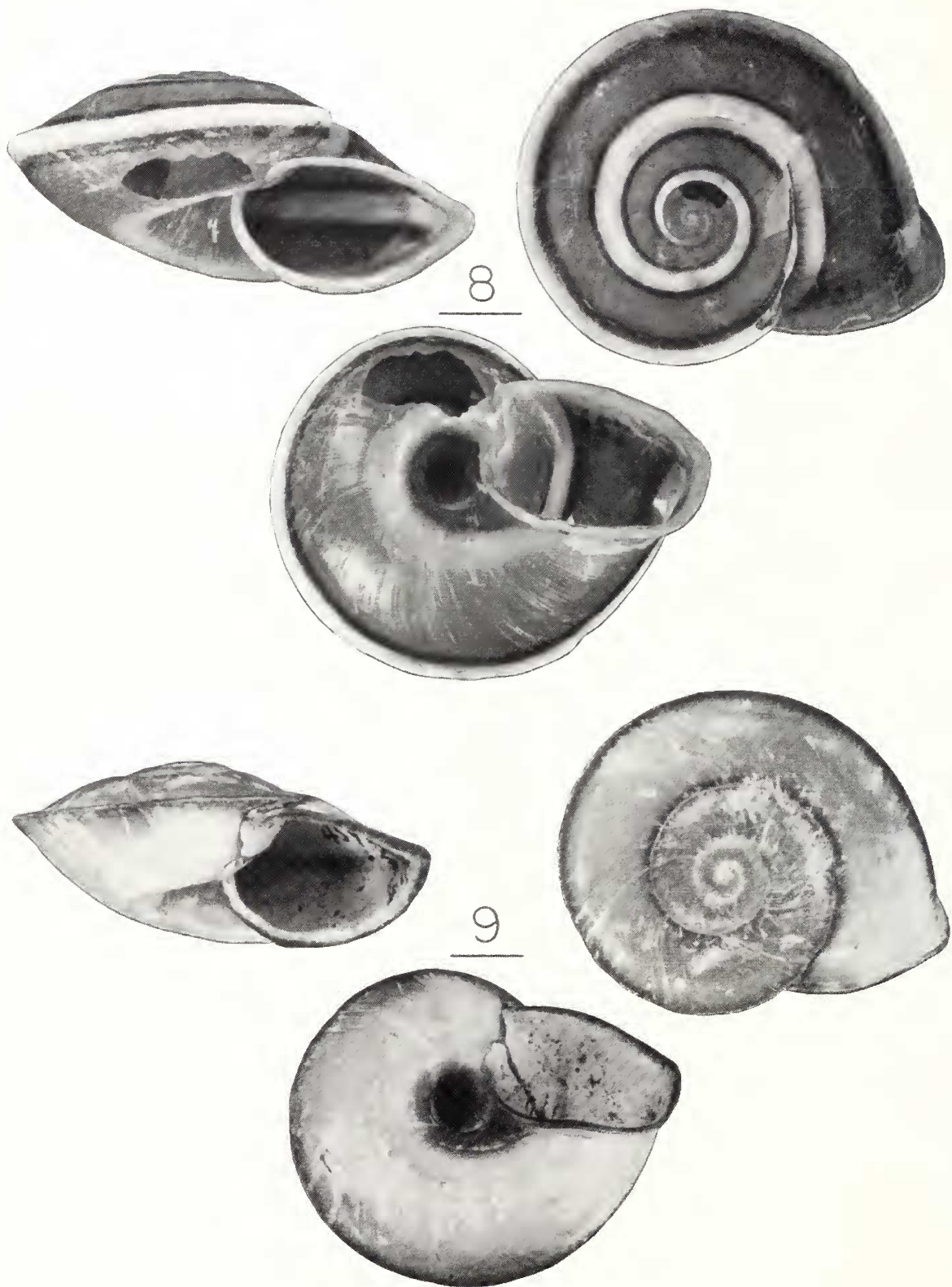
HOLOTYPE. USNM 880358 (ex MBI 201.50DH, ad shell): 12°44'S, 49°30'E: Madagascar: Analamera Reserve, 315 m: dry deciduous forest. 15 Jul. 1995.

PARATYPES. AMS C.203488 (ex MBI 201.50DP, 1 ad): type locality. MNHN (ex MBI 201.50DP, 1 ad): type locality. ANSP 401990 (ex MBI 201.50DP, 1 ad): type locality. USNM 880409 (ex MBI 201.50DP, 14 ad, 45 juv & frag): type locality.

DESCRIPTION OF HOLOTYPE. Diameter 27.2 mm, height 13.6 mm, whorls 4.8. Body-whorl periphery carinate; suture deeply impressed, very slightly crenulate; shoulder moderate, flat. Umbilicus funneled, faintly enlarged by a slightly angular rim; width 4.5 mm (0.17 shell diameter). Aperture compressed-elliptical, height 5.3 mm, width 11.3 mm. Aperture downward deflection strong, <0.1 whorl; face angle (relative to axis of coiling) 55°. Apertural lip reflection grading from no reflection at the suture, to narrowly reflected at the columella; edge sharp. Embryonic whorls 2.2; embryonic sculpture nearly smooth, with very faint riblets. Shell sculpture consists of closely spaced, even, sharp, transverse ridges that bear, when fresh, periostracal lamellar-like extensions. Color an even yellowish brown, lighter in the umbilicus.

VARIATION. Adult paratype diameters range 25.2-28.5 mm.

COMPARISONS. Among Fischer-Piette *et al.*'s (1994)



Figs. 8-9. Fig. 8. *Ampelita akoratsara* sp. nov. holotype. Fig. 9. *A. ranomafanae* sp. nov. holotype. Scale bars 5 mm.

group 4 (carinate, widely umbilicate) species, unique for its distinctive sculpture. Most closely resembles *Ampelita namerokoensis* Fischer-Piette, 1952, in size and coiling tightness, but is higher spired and more narrowly umbilicate. In its strong pre-apertural deflection it resembles *A. bathiei* Fischer-Piette, 1952, and *A. akoratsara* sp. nov., but is much more tightly coiled, and its upper apertural lip is unreflected.

ETYMOLOGY. For Analamera Reserve, the type locality.

Ampelita ranomafanae sp. nov.

Fig. 9

HOLOTYPE. USNM 880359 (ex MBI 459.50DH, ad shell): 21°13'S, 47°25'E: Madagascar: Ambatolahy, adjacent to Ranomafana National Park, 850 m: rainforest. 9 Oct. 1995.

PARATYPE. USNM 880410 (ex MBI 459.50DP, 1 juv): type locality.

DESCRIPTION OF HOLOTYPE (originally with about a third of its periostracum, most of which has flaked off; shell somewhat eroded). Diameter 28.2 mm, height 12.9 mm, whorls 4.1. Body-whorl periphery very sharply carinate, upper surface of carina broad and nearly flat; suture shallowly impressed, simple; shoulder narrow, flatly rounded. Umbilicus steep-sided, enlarged by an angular, raised rim; width 4.4 mm (0.16 shell diameter). Aperture compressed-elliptical, height 7.0 mm, width 11.1 mm. Aperture downward deflection slight, <0.1 whorl; face angle (relative to axis of coiling) 45°. Apertural lip reflection narrow, thin, incompletely rolled, even in width. Embryonic whorls 2.0; embryonic sculpture apparently initially smooth, then pustulose. Shell slightly glossy, with parallel spiral grooves transected by slightly stronger growth lines; appearance almost beaded in places. Color yellowish brown, with carina, suture, and peristome a dark, purplish brown.

COMPARISONS. See comparisons under *Ampelita akoratsara* sp. nov.

ETYMOLOGY. For Ranomafana National Park, adjacent to the type locality.

Group 5. Non-carinate, rounded periphery; low spired; umbilicus broad; peristome broadly flared; with or without dorsal, spiral gutter.

Ampelita josephinae sp. nov.

Fig. 10

HOLOTYPE. USNM 880360 (ex MBI 357.50DH and AH, ad shell and pulled body in alc): 16°19'S, 49°46'E: Madagascar: W of Sahasoa, 330 m: hardwood rainforest. 21 Oct. 1995.

PARATYPES. AMS C.203489 (ex MBI 355.50DP, 1 ad): 16°19'S, 49°44'E: Madagascar: W of Mount Andaitra, 510 m: hardwood and pandanus; 19 Oct. 1995. MNHN (ex MBI

351.50DP, 1 ad): 16°19'S, 49°44'E: Madagascar: summit Mount Andaitra, 515 m: hardwood and pandanus; 18 Oct. 1995. ANSP 401991 (ex MBI 351.50DP, 1 ad): 16°19'S, 49°44'E: Madagascar: summit Mount Andaitra, 515 m: hardwood and pandanus; 18 Oct. 1995. USNM 880411-880420 (ex MBI 347-357DP, 10 lots; total 24 ad, 5 juv): 16°S, 49°E: Madagascar: Mount Andaitra area, 300-515 m; Oct. 1995.

DESCRIPTION OF HOLOTYPE. Diameter 37.2 mm, height 19.7 mm, whorls 4.1. Body-whorl periphery broadly rounded; suture moderately impressed, simple; shoulder broad, gently rounded. Umbilicus a pinhole, then rapidly expanding in the last half whorl; artificially enlarged by a rounded rim offset internally by two parallel grooves; width 2 mm (0.07 shell diameter). Aperture broadly auriculate, height 9.3 mm, width 15.5 mm. Aperture downward deflection strong, 0.1 whorl; face angle (relative to axis of coiling) 60°. Apertural lip very broadly and flatly reflected, wider above; edge sharp, rolled back. Embryonic whorls 2.2; embryonic sculpture nearly smooth, then with faint, interrupted, transverse riblets. Shell with a satin-like sheen, covered with small, low pustules, and with faint, irregular growth lines. Color a dark, vivid yellow, with light-yellow flecks; apex and inner and outer peristome dark brownish purple; outer edge of peristome white; apertural interior white; the shell is white where peristome has flaked off.

VARIATION. All adult specimens very similar in size and shape.

COMPARISONS. Other than *Ampelita perampla* Dautzenberg, 1907 (as redefined by Fischer-Piette *et al.*, 1994), this is the only flared-lip *Ampelita* without a conspicuous dorsal, spiral gutter. It differs from *A. perampla* in its more rapid post-embryonic whorl expansion (diameter of first three whorls 12.8 mm vs. 9.9 mm), its lower spire, its fainter and sparser pustulate sculpture, its proportionally smaller, less flared aperture, and its subtly different umbilicus.

ETYMOLOGY. For Josephine Djaohasara Emberton, the author's wife, who helped him collect this lovely species.

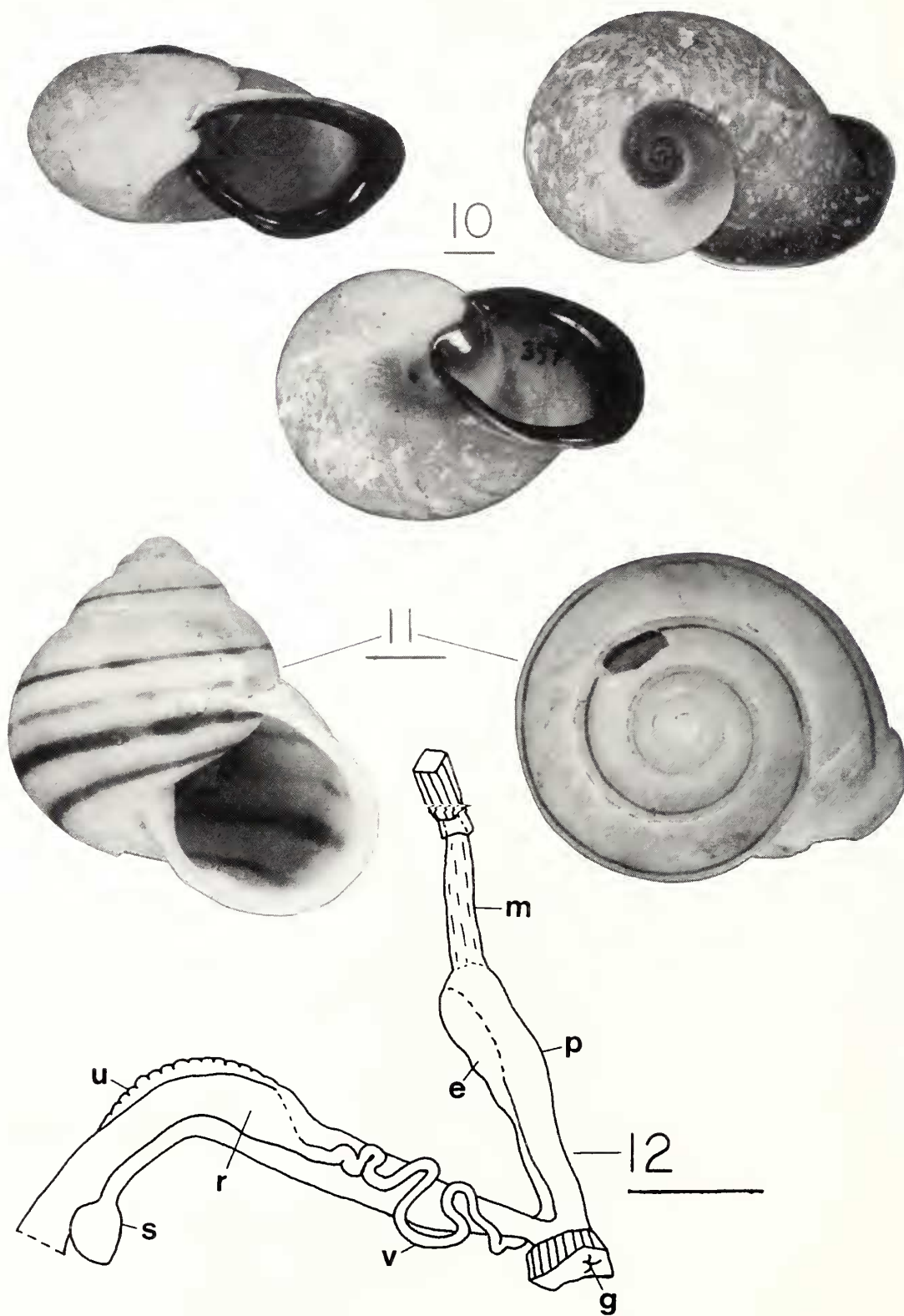
Group 6 = *Ampelita (Eurystyla)* Ancy, 1887. Non-carinate, rounded periphery; high spired; imperforate to creviced; peristome moderately reflected; no dorsal, spiral gutter.

Ampelita (Eurystyla) griffithsi sp. nov.

Figs. 11, 12

HOLOTYPE. USNM 880361 (ex MBI 250.50DH and AH, ad shell and pulled body in alc): 19°8'S, 44°49'E: Madagascar: S Bemaraha Reserve, 80 m: river gallery forest. 16 June 1995.

PARATYPES. AMS C.203490 (ex MBI 247.50DP, 3 ad, 6 juv and frag): 20°3'S, 44°39'E: Madagascar: Kirindy, 40 m: river gallery forest; 15 June 1995. AMS C.203491 (ex MBI 249.50DP,



Figs. 10-12. Fig. 10. *Ampelita josephinae* sp. nov. holotype. Figs. 11-12. *A. (Eurystyla) griffithsi* sp. nov. holotype: Fig. 11 shell in two views; Fig. 12 genitalia (abbreviations: e epiphallus, g genital pore, m penial retractor muscle, p penis, r prostate, s spermatheca, u uterus, v vas deferens). Scale bars 5 mm.

4 ad, 5 juv and frag): 19°8'S, 44°50'E: Madagascar: Bemaraha Reserve: river gallery forest; 16 June 1995. AMS C.203492 (ex MBI 494.50DP, 2 ad, 1 juv): 18°45'S, 44°45'E: Madagascar: N Bemaraha Reserve, 280 m: semideciduous forest; 29 June 1996. AMS C.203493 (ex MBI 495.50DP, 1 ad, 2 juv): 18°47'S, 44°47'E: Madagascar: N Bemaraha Reserve, 300 m: deciduous scrub; 29 June 1996. MNHN (ex MBI 249.50DP, 1 ad): 19°8'S, 44°50'E: Madagascar: Bemaraha Reserve: river gallery forest; 16 June 1995. ANSP 401992 (ex MBI 247.50DP, 1 ad): 20°3'S, 44°39'E: Madagascar: Kirindy, 40 m: river gallery forest; 15 June 1995. Nationaal Natuurhistorisch Museum, Leiden, the Netherlands 59149 (1 ad in alcohol): 19°9'S, 44°49'E: Madagascar: Bemaraha Reserve. USNM 880421-880426 (ex MBI 247-251DP and 488-495DP, 6 lots; total 10 ad, 21 juv and frag): 20°3'S, 44°39'E: Madagascar: Kirindy and Bemaraha Reserve; 1995, 1996.

DESCRIPTION OF HOLOTYPE. SHELL (a very thin, brownish yellow periostracum remains on some paratypes but is lost from the holotype). Diameter 22.2 mm, height 23.6 mm, whorls 4.2. Body-whorl periphery broadly rounded; suture moderately impressed, simple; shoulder falling off steeply, broadly rounded. Umbilicus a crevice; width 0.8 mm (0.04 shell diameter). Aperture oval, height 10.6 mm, width 10.8 mm. Aperture downward deflection slight, 0.2 whorl; face angle (relative to axis of coiling) 30°. Apertural lip reflection narrowly and evenly rolled, expanded at the columellar insertion. Embryonic sculpture smooth, then with faint, wavy riblets. Shell with a faint sheen, covered with small pustules, and with low growth lines and traces of spiral lines. Color whitish yellow, with four thin, dark-brown bands.

GENITALIA. Genital pore far forward, just behind the right tentacle. Right tentacular retractor muscle passes between the penis and the vagina. Atrium small, without appendages. Penis 10 mm in length, about six times as long as wide. Penial retractor muscle insertion on the penial apex, origin on the interior body wall near the junction of the left mantle collar, origin apparently enveloped by a small, thin sheath. Vas deferens long, convoluted, bound to the penis by connective-tissue strands. Epiphallus bulbous, thin-walled, adherent to the penis. Vagina about two-thirds the length of the penis. Lower spermathecal (bursal, gametolytic) duct slightly swollen; upper duct slender, opening into a small, globular spermatheca (bursa copulatrix, gametolytic gland); spermatheca plus duct about the same length as the penis.

VARIATION. Adult shells more elevated at MBI 247 and 249 (H/D 1.1), smaller at MBI 494 and 495 (smallest diameter 19.2 mm); all paratypes lack columellar apertural node.

COMPARISONS. In size and shape most similar to *Ampelita (Eurystyla) viridis* (Deshayes, 1838), but with a pronouncedly sharper spire, tighter coiling, exposed umbilicus, and much different sculpture. In penial morphology, very similar to *A. (E.) cerina* (Morelet, 1877) (Fischer-

Piette and Garreau de Loubresse, 1965:fig. 20).

ETYMOLOGY. For Owen Griffiths, collector of this species.

COMMENTS. Discovery of *Ampelita (Eurystyla) griffithsi* sp. nov. greatly expands the geographical, ecological, and morphological ranges of its subgenus.

Genus *Clavator* von Martens in Albers, 1860

Clavator griffithsjonesi sp. nov.

Figs. 13, 14

HOLOTYPE. USNM 880362 (Fig. 14, ex MBI 483.50DH, ad shell; and ex MBI 483.50AH (pulled body in alc): 18°1'S, 44°31'E: Madagascar: N Bemaraha Reserve. 22 June 1996.

PARATYPES. AMS C.203494 (ex MBI 483.50DP, 2 ad, 2 juv): type locality. MNHN (ex MBI 483.50DP, 1 ad): type locality. ANSP 401993 (ex MBI 483.50DP, 1 ad): type locality. USNM 880363 (Fig. 13, ex MBI 483.50DPR, juv shell; and ex MBI 483.50DP [2 juv & frag] and AP [1 ad in alc]): type locality. USNM 880427 (ex MBI 484.50DP, 1 ad): 18°3'S, 44°31'E: Madagascar: N Bemaraha Reserve; 23 June 1996.

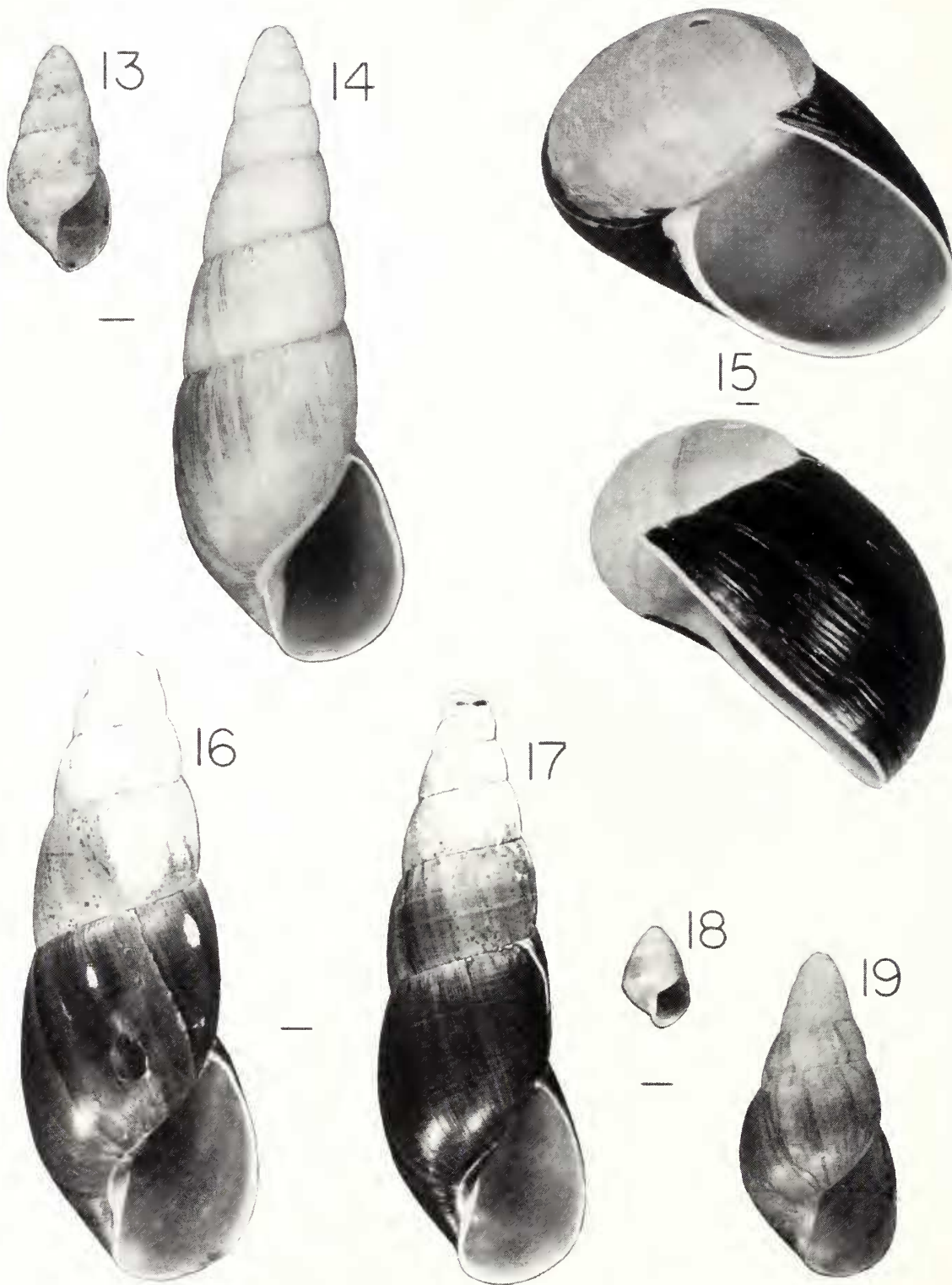
DESCRIPTION OF HOLOTYPE (apex broken). Diameter 32.7 mm, height 91.4 mm, whorls 9.6 (estimated). Body-whorl periphery flatly rounded; suture strongly impressed, very slightly guttered, slightly crenulate; shoulder narrow, steeply sloped. Umbilicus a narrow crevice; width 0.3 mm (0.01 shell diameter). Aperture slightly auriculate, height 28.3 mm, width 15.5 mm. Aperture downward deflection slight, <0.01 whorl; face angle (relative to axis of coiling) 10°. Apertural lip reflection slight, thick, and even but broadened at the columella. Shell somewhat glossy, with fine, closely spaced riblets and irregularly spaced growth-interruption lines; a faint subsutural line sometimes detectable. Color light yellow-brown to almost white, with occasional streaks and splotches of darker, somewhat reddish brown.

EMBRYONIC-SHELL CHARACTERS (Paratype USNM 880363). Embryonic whorls 4.2; embryonic sculpture nearly smooth in the first whorl; subsequent whorls with closely spaced riblets; subsuture can be slightly corded.

VARIATION. Only slight variation in height and apertural shape.

COMPARISONS. Unique in its shape and strongly ribbed sculpture; superficially somewhat like a giant *C. moreleti* (Férussac, 1851); much more tightly coiled and straight-sided than *C. clavator* (Petit de la Saussaye, 1844), *C. grandidieri* (Crosse and Fischer, 1868), and *C. antecavator* Fischer-Piette, 1963, which it can resemble somewhat in color.

ETYMOLOGY. For Owen Griffiths (Bioculture Mauritius) and Dr. Carl Jones (Jersey/Mauritius Wildlife Appeal Fund), collectors of this species.



Figs. 13-19. Figs. 13-14. *Clavator griffithsjonesi* sp. nov.: Fig. 13 juvenile paratype with complete apex; Fig. 14 holotype adult with broken apex. Fig. 15. *Helicophanta gargantua* sp. nov. holotype in two views. Figs. 16-19. *Clavator masoalae* sp. nov.: Fig. 16 holotype adult with naturally truncate apex; Fig. 17 paratype adult with truncate apex; Fig. 18 paratype small juvenile with complete apex; Fig. 19 paratype large juvenile with broken apex. Scale bars 5 mm.

Clavator masoalae sp. nov.

Figs. 16-19

HOLOTYPE. USNM 880364 (Fig. 16, ex MBI 309.51DH, ad shell; and ex MBI 309.51AH, ad body, partially decayed, in alc): 15°33'S, 50°0'E: Madagascar: Masoala National Park, 1000 m: hardwood rainforest with palms, pandanus, and tree moss. 26 Sep. 1995.

PARATYPES. AMS C.203495 (ex MBI 309.51DP, 1 ad, 1 juv): type locality. MNHN (ex MBI 309.51DP, 1 ad, 1 juv): type locality. ANSP 401994 (ex MBI 309.51DP, 1 ad, 1 juv): type locality. USNM 880365 (Fig. 17, ex MBI 744.50DPR, 1 ad; and ex MBI 744.50AP, pulled body in alc): 16°46'S, 49°8'E: Madagascar: Ambatovaky Reserve, 1025 m: rainforest with pandanus; 21 Nov. 1995. USNM 880366 (Fig. 19, ex MBI 296.50DPR, 1 juv; and ex MBI 296.50AP, 1 juv and pulled juv body in alc): 15°47'S, 50°3'E: Madagascar: Masoala National Park, 310-450 m; 19 Sep. 1995. USNM 880367 (Fig. 18, ex MBI 605.50DPR, 1 juv): 14°26'S, 49°45'E: Madagascar: Marojejy Reserve, 1200 m: rainforest. ; 16 Sep. 1995. USNM 880428 (ex MBI 308.50DP [1 ad, 2 juv] and AP (1 ad, partially decayed, in alc): 15°33'S, 50°0'E: Madagascar: Masoala National Park, 680-1000 m; 26 Sep. 1995. USNM 880429 (ex MBI 309.51DP [5 ad, 7 juv] and AP (1 juv in alc): type locality. USNM 880430-880434 (ex MBI 593-644DP, 5 lots; total 5 ad, 18 juv): 14°S, 49°E: Madagascar: Marojejy Reserve, 900-1350 m: rainforest; Sep. 1995. USNM 880435-880440 (ex MBI 741-749DP, 6 lots; total 9 ad, 5 juv): 16°S, 49°E: Madagascar: Ambatovaky Reserve, 870-1055 m; Nov. 1995.

DESCRIPTION OF HOLOTYPE. Diameter 36.0 mm, height 105.9 mm, apex naturally truncated, whorls estimated at approximately 9.4. Body-whorl periphery flatly rounded; suture strongly impressed, slightly crenulate; shoulder narrow, steeply sloped. Umbilicus imperforate, with a translucent callus. Aperture slightly auriculate, height 35.2 mm, width 19.3 mm. Aperture downward deflection slight, <0.01 whorl; face angle (relative to axis of coiling) 10°. Apertural lip reflection slight, thick, even but broadened at the columella. Shell somewhat glossy, with frequent, low, fairly regular growth lines crossed by fairly regularly spaced spiral lines. Color of embryonic whorls light yellow-brown; later whorls becoming progressively more reddish-brown with darker transverse streaks; body whorl reddish brown; apertural lip white; apertural interior bluish white.

EMBRYONIC-SHELL CHARACTERS (Paratypes USNM 880366 and 880367). Embryonic whorls 4.9; embryonic sculpture of faint riblets in the first whorl; subsequent whorls with closely spaced riblets cut by spiral lines to produce a strongly beaded appearance.

VARIATION. Aperture wide in some specimens, minimum H/W 1.6; shells from Ambatovaky Reserve are slender (Fig. 17).

COMPARISONS. In form, color, and sculpture, superficially resembles *C. eximius* (Shuttleworth, 1852); *C. dingeoni* Fischer-Piette, Blanc, and Salvat, 1975; *C. pauliani*

Fischer-Piette, 1963; and *C. bathiei* Fischer-Piette, 1963; but conspicuously tighter coiling than the first three and slightly tighter coiling, a more acute apex, a proportionally larger aperture, and stronger spiral sculpture than *C. bathiei*.

ETYMOLOGY. For Masoala National Park, the type locality.

Genus *Helicophanta* Férussac, 1821

Helicophanta gargantua sp. nov.

Fig. 15

HOLOTYPE. USNM 880368 (ex MBI 1402.50DH and AH, ad shell and pulled body in alc): 22°4'S, 46°54'E: Madagascar: near Andringitra Reserve. 3 Oct. 1992.

PARATYPES. AMS C.203758 (ex MBI 1402.50DP, 1 ad): type locality. MNHN (ex MBI 1402.50DP, 1 ad): type locality. ANSP 401995 (ex MBI 1401.50DP, 1 ad): type locality. pre-1992. ANSP 401996 (ex MBI 1402.50DP, 17 ad, 11 juv): type locality. ANSP A19000 (ex MBI 1402.50AP, 2 ad, 2 juv): type locality. USNM 880369 (ex MBI 1402.50DPR, juvenile broken shell): type locality.

DESCRIPTION OF HOLOTYPE (apex eroded, so juvenile paratype USNM 880369 consulted to confirm embryonic sculpture). Diameter 90.9 mm, height 79.3 mm, whorls 4.5. Body-whorl periphery broadly rounded; suture strongly impressed, simple; shoulder steeply sloped, flattened. Umbilicus imperforate, with a thick white callus. Aperture broadly elliptical, height 60.6 mm, width 55.8 mm. Aperture downward deflection extreme, 0.5 whorl; face angle (relative to axis of coiling) 40°. Apertural lip reflection slight, thick, even. Embryonic whorls 3.5; embryonic sculpture consisting of elongate, transverse pustules arrayed as growth lines. Shell glossy, with strong, nearly regular growth lines; faint, suprapерipheral spiral cords; and small, obscure, subperipheral, oblique cut marks. Color very dark brown, with reddish undertint; spiral cords darker brown; light beige where periostracum eroded; apertural lip and interior white.

COMPARISONS. Most similar in form and sculpture to *H. gloriosa* (Pfeiffer, 1856), from which it differs in its tighter initial coiling (10.0 vs 11.2 mm diameter of first 2.5 whorls) but much larger embryonic shell (3.6 vs. 3.2 whorls) and adult shell.

ETYMOLOGY. For the very large (Rabelais's fictional giant, Gargantua) shell size.

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